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LETTER TO THE EDITOR

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A case of a hand burns associated with a "wrap-around" pulse oximeter in an infant

Dear Editors,

Burn injuries associated with various types of pulse oximeters have been reported sporadically in the literature.[1-3]

We have encountered a case of burns inflicted by a "wrap-around" pulse oximeter in a 2-month-old infant who had been admitted to the intensive care unit following a diagnosis of bronchopneumonia. The patient was ventilated but required no inotropic support. Oxygen saturation monitoring was performed with a reusable neonatal wrap sensor (M1193A SpO2 Sensor®, Philips Medizin Systeme, Germany) (Figure 1), attached on her left hand, continuously for 3 days. She was referred to us with a localised skin discolouration to the dorsal ulnar aspect of the left hand (Figure 2), coinciding with the size and shape of the sensor. She was treated conservatively by applying topical fusidic ointment. The skin remains intact and the discolouration has faded before her discharge, 8 days after our initial encounter. The injury was classified as superficial epidermal burn.

Several mechanisms have been postulated in burns associated with the pulse oximeter. Thermal burn occurs due to sensor overheating in a malfunctioning device or prolonged duration of exposure,[2] electrical burn induced by current leakage from a damaged sensor's electrical components, and chemical burn caused by a topical reaction to sterilising agents contaminating the probe contact area.[3] Also, patients with decreased peripheral perfusion and the thinner skin of the infants and advanced elderly patients are factors contributing to the development of burn injury.[2]

Our described case demonstrates a thermal burn injury secondary to a prolonged application of the pulse oximeter. Device inspection by the local maintenance service following the injury revealed no faulty components. To avoid this complication, frequent assessment of the sensor sites and the device was carried out, and relocating the sensor every 2 to 4 hours has been advocated.[2] These manoeuvres appear simple but often overlook. Deviation from standard practice could lead to more catastrophic sequelae.[4]

All health professionals should be aware of this possible reaction and remain vigilant in assessing patients requiring pulse oximeter monitoring, especially in infants.

FIGURE 1 The neonatal wrap pulse oximeter

FIGURE 2 Burn injury conform to the size and shape of the sensor

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REFERENCES

1. Ceran C, Taner OF, Tekin F, Tezcan S, Tekin O, Civelek B. Management of pulse oximeter probe–induced finger injuries in children: report of two consecutive cases and review of the literature. *J Pediatr Surg*. 2012;47(11):e27-e29.
2. Pennsylavania Patient Safety Authority. *Skin Integrity Issues Associated with Pulse Oximetry*. Harrisburg, PA: Pennsylvania Patient Safety Authority; 2005;2(2):25–9.
3. Jung SN, Hwang DY, Kim J, Kwon H, Yim YM. Pulse oximeter probe-induced electrical burn. *Burns*. 2009;35(5):751-753.
4. Ghai B, Md DNB, Naik A, Rupal S, Madan R. Toe gangrene in an infant subsequent to use of pulse oximeter for short duration. *Anesth Analg*. 2005;100(2):602.